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DIFFERENCES IN CATCH RESULTS USING WIRE TRAPS WITH DIFFERENT BAITS IN LAKE KELARI, MUARO JAMBI VILLAGE

Perbedaan Hasil Tangkapan Bubu Kawat dengan Menggunakan Umpan yang Berbeda di Danau Kelari Desa Muaro Jambi

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ABSTRACT

This study aims to compare the fishing performance of wire traps (bubu kawat) using two different types of bait, namely oil palm fruit and coconut pulp, in Kelari Lake, Muaro Jambi. The research was conducted over a period of 20 days with two treatments and a total of 20 repetitions. Each treatment used 10 units of wire traps placed randomly at the study site. The observed parameters included fish species, number and weight of catches, and frequency of fish occurrence. The results showed that seven fish species were captured during the study, namely Nilem (*Osteochilus vittatus*), Kapiat (*Puntioplites falcifer*), Sebarau (*Hampala ampalong*), Tembakang (*Helostoma temminckii*), Gabus (*Channa striata*), Sepat (*Trichopodus pectoralis*), and Baung (*Hemibagrus nemurus*). Nilem was the most frequently caught species in both bait treatments, while Gabus had the lowest catch frequency. Statistically, there was no significant difference (P>0.05) in the number and weight of catches between the two bait types, although coconut pulp produced slightly higher catch numbers. Environmental parameters such as temperature, pH, and water depth were within the optimal range for freshwater fish, supporting the fishing activity. This study concludes that both bait types can be effectively used with wire traps, but oil palm fruit provides more consistent results for fishermen in Kelari Lake.

Keywords: Catch Results, Coconut Pulp Bait, Kelari Lake, Oil Palm Fruit Bait, Wire Trap

ABSTRAK

Penelitian ini bertujuan membandingkan hasil tangkapan bubu kawat menggunakan dua jenis umpan, yaitu kelapa sawit dan ampas kelapa, di Danau Kelari, Muaro Jambi. Penelitian dilakukan selama 20 hari dengan dua perlakuan dan total 20 kali pengulangan. Setiap perlakuan menggunakan 10 unit bubu yang dipasang secara acak. Parameter yang diamati meliputi jenis ikan, jumlah dan berat tangkapan, serta frekuensi kemunculan ikan. Hasil penelitian menunjukkan terdapat tujuh spesies ikan yang tertangkap, yaitu Nilem, Kapiat, Sebarau, Tembakang, Gabus, Sepat, dan Baung. Ikan Nilem merupakan jenis yang paling banyak tertangkap pada kedua jenis umpan, sedangkan ikan Gabus menjadi tangkapan terendah. Secara

statistik, perbedaan jumlah dan berat tangkapan antara kedua umpan tidak menunjukkan perbedaan nyata (P>0,05), meskipun ampas kelapa menghasilkan jumlah tangkapan sedikit lebih tinggi. Parameter perairan seperti suhu, pH, dan kedalaman berada pada kisaran optimal bagi ikan air tawar, sehingga mendukung aktivitas penangkapan. Penelitian ini menyimpulkan bahwa kedua umpan dapat digunakan secara efektif, namun kelapa sawit memberikan hasil yang lebih stabil bagi nelayan di Danau Kelari.

Kata Kunci: Bubu Kawat, Danau Kelari, Umpan Ampas Kelapa, Umpan Kelapa Sawit, Hasil Tangkapan

INTRODUCTION

Muaro Jambi Regency is one of the administrative regions in Jambi Province, which geographically lies between 1°51' to 2°1' South Latitude and 103°15' to 104°30' East Longitude. This region is divided into 11 sub-districts, one of which is Muaro Sebo Sub-district, which covers an area of approximately 261.47 km² (Badan Pusat Statistik Provinsi Jambi, 2023). Muaro Sebo Sub-district comprises 20 villages, namely Bakung, Baru, Danau Kedap, Danau Lamo, Jambi Kecil, Jambi Kulo, Kemingking Dalam, Kemingking Luar, Kunangan, Lubuk Raman, Mudo, Mudung Darat, Niaso, Sekumbung, Setiris, Talang Duku, Tanjung Katung, Tebat Patah, Teluk Jambu, as well as Muara or Muaro Jambi Village (BPS Muaro Jambi, 2020).

In Muaro Jambi Village, there are two adjacent lakes, namely Kelari Lake and Serapil Lake, which are separated only by a narrow water channel between them. Kelari Lake itself is part of an ancient canal network that includes Parit Buluran Dalam, Jambi River, and Parit Selat. Parit Selat, located at the eastern end, functions as a direct channel leading to the Batanghari River (Pratiwi, 2017). Kelari Lake, located in Muaro Jambi, is one of the areas rich in biodiversity, including various fish species that are targeted for capture. The abundance of fisheries resources provides opportunities for local communities to increase their income through fishing activities. However, to achieve optimal catches, efficient and environmentally friendly fishing methods are required (Sari *et al.*, 2020). Residents around Kelari Lake utilize the lake as a fishing ground. Several fish species commonly caught include snakehead fish, tambakan fish, and catfish. Fish traps (bubu) are the most widely used fishing gear by fishermen in Muaro Jambi Village. In addition to being affordable, bubu are also easy to use, making them highly suitable for fishermen with limited capital.

Bubu or fish traps are passive fishing gears that are installed in waters for a certain period of time. Their design allows fish to enter easily while making it difficult for them to escape. To increase effectiveness, bubu are often equipped with attractant bait. The materials used for their construction vary, ranging from natural materials such as bamboo, wood, and rope, to synthetic materials such as nets (Sukamto *et al.*, 2019). Bubu are passive fishing gears; therefore, attractants or bait are required to encourage target fish to enter the trap (Sudirman and Mallawa, 2004). The types of bait used are highly diverse, including live bait such as golden snails or other types of bait. The placement of bait inside the bubu is generally positioned in the middle of the trap, either at the bottom, center, or top, by tying or hanging it with or without bait wrapping (Martasuganda, 2003).

Bait functions to attract fish to enter the bubu (Arimoto *et al.*, 2008). The selection of appropriate bait can significantly increase catch yields. Currently, fishermen in Kelari Lake generally usedne using oil palm fruit as bait for bubu. The use of oil palm is based on its availability and ease of acquisition (Waworuntu *et al.*, 2015). In addition to oil palm, coconut dregs are an abundant resource in Kelari Lake (Kadir *et al.*, 2018). Based on the results of analyses conducted by the Institut Pertanian Bogor (IPB) on the nutritional composition of Medium Quality Feed (PKM) derived from oil palm fruit, it was found that the protein content

ranges from 15–18%; contains approximately 10% essential amino acids; fat content of 9.5%; crude fiber reaching 25.19%; and a calcium to phosphorus ratio of 1:2.4. This study aims to determine the effect of bait type on the catch results of wire bubu at the study location.

METHODS

Time and Place

This research was conducted in Danau Kelari Village, Muaro Jambi Regency, Muaro Sebo District, Muaro Jambi, Jambi Province from July 26 to August 15, 2025.

Materials and Equipment

The materials used in this study consisted of wire fish traps (bubu kawat), a mobile phone camera, buckets, a digital weighing scale, stationery, a measuring tape, gauze, tissues, a laptop, a pH meter, and a thermometer. The materials used were oil palm fruit, coconut dregs, and water.

Research Methods

The research method employed was experimental fishing, namely conducting direct fishing operations in Kelari Lake, Muaro Jambi Village. The study consisted of two treatments based on the type of bait used and was repeated 20 times. These two treatments were based on two different types of bait used in the study, as follows: (A) using oil palm bait (*Elaeis guineensis*) with 10 bubu traps, and (B) using coconut dregs bait (*Cocos nucifera*) with 10 bubu traps.

Work Procedures

This study was conducted through several stages, which are as follows:

1. Preparation Stage

Prior to initiating the fishing activities, a series of preparations were carried out, including the preparation of equipment and materials required for the study. This stage involved checking and assembling all equipment to be used during the data collection process at the fishing location.

2. Data Collection Stage

During the research period, data were collected through fishing activities using wire bubu traps. Fishing was conducted with 20 repetitions using two different types of bait. Each treatment involved 20 units of bubu traps using oil palm fruit bait and coconut dregs bait, with each bait type used at a weight of 50 grams. The bait was placed randomly within groups in each repetition to ensure that the data obtained were accurate.

Subsequently, the fishing gear was deployed in the afternoon at 17:00 WIB. The setup process began by submerging a stake attached to the bubu and anchoring it as a marker and as a tie for the main rope of the fishing gear to the riverbed. Depth, temperature, and pH were measured to determine environmental parameters. The bubu traps were submerged with weights made of ordinary stones, which functioned to keep the traps on the bottom. The bubu traps were soaked for 14 hours.

Data collection for each bubu was conducted sequentially, with a distance of 1 meter between each trap, and bait placement was randomized for each bubu. The bubu traps used had a length of 80 cm, an entrance width of 20 cm, a mesh size of 3 cm, and a fish retrieval door measuring 20 cm.

3. Hauling Stage

The hauling process was carried out in the morning at 07:00 WIB. The catch contained within the bubu traps was removed, after which the traps were cleaned, reset, and then re-soaked or immersed. If no catch was found inside the bubu traps, the traps were still lifted and cleaned, reset, and then re-soaked or immersed.

Data analysis

a. T Test

This study used a T-test analysis. The data analyzed included the number of catches from each wire trap with oil palm and coconut pulp bait, as well as the weight of the catch. The data obtained were analyzed using the T-test formula (Sudjana, 2005), as follows:

$$T\,hit = \frac{\bar{X}_1 - \bar{X}_2}{s\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}}$$

$$S_{1^2} = \frac{n\sum 1^2 - (X1)^2}{n(n-1)}$$

$$S_{2^2} = \frac{n\sum 2^2 - (X2)^2}{n(n-1)}$$

$$S^2 = \frac{(n_1 - 1)S1^2 + (n_2 - 1)S2^2}{n_1 + n_2 - 2}$$

Information:

$T\,hit$ = T-value
$\bar{X}_1$ = Average catch of oil palm fruit bait
$\bar{X}_2$ = Average catch of golden snail bait
n_1 = Number of palm fruit bait samples
n_2 = Number of golden snail bait samples
S_1^2 = Sample space
S_2^2 = Sample space
S = Standard deviation

b. Analysis of Catch Composition

The catch composition is obtained from the total catch obtained from the type of fishing gear used, namely wire traps. This composition includes the number of fish species (tails) and the weight (g) for each type of fish caught. The calculation of fish production during data collection was carried out using the formula proposed by Omar (2010):

$$pi = \frac{ni}{N}\,x\,100\%$$

Information:

ρi = Relative abundance of catch (%)
ni = Number of species caught (tails)
N = Number of trap catches (tails)

c. Fish Occurrence Frequency Analysis

The frequency of occurrence of each type of fish caught can be calculated using the formula proposed by (Kadir *et al*., 2019) as follows:

$$Fr = \frac{JK}{T}\,x\,100\%$$

Information:

Fr = Relative frequency
JK = Number of occurrences of each type of fish caught
T = Total trip

RESULTS

Research Location Conditions

The research was conducted at Kelari Lake, Muaro Sebo District, Muaro Jambi Regency. A map of the research location can be seen in Figure 1.

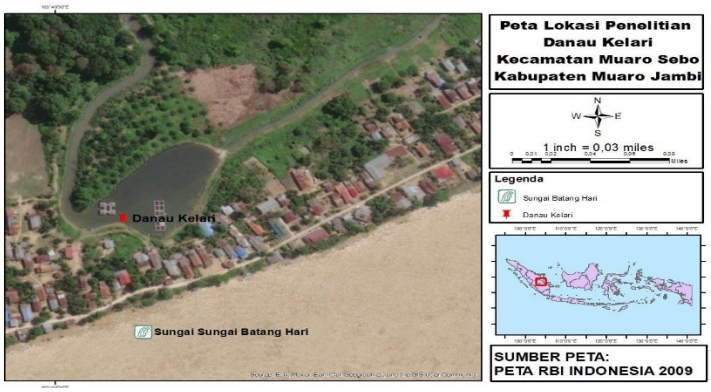

Figure 1. Research Location Map

Wire Trap Catch Results

Fish species composition can influence the growth of fish populations in waters. Research conducted in Kelari Lake, Muaro Sebo District, Muaro Jambi Regency, yielded varying results using different baits and wire traps. The types of fish caught during the study are shown in Table 1.

Type	Latin name	TREATMENT							
		Palm oil				Coconut Dregs			
		Number (tail)	(%)	Weight (g)	%	Number (tail)	%	Weight (g)	%
Nilem	*Osteochilus hasseltii*	24	25.81	1078	23.37	29	32.58	1387	36.61
Sebarau	*Hampala macrolepidota*	14	15.05	563	12.21	14	15.73	533	14.07
Kapiat	*Barbonymus schwanenfeldii*	25	26.88	1205	26.13	22	24.72	928	24.49
Tembakang	*Helostema temminckii*	20	21.51	624	13.53	16	17.98	496	13.09
Gabus	*Channa Striata*	3	3.23	660	14.31	0	0.00	0	0.00
Sepat	*Trichopodus pectoralis*	4	4.30	139	3.01	6	6.74	260	6.86
Baung	*Hemibagrus nemurus*	3	3.23	343	7.44	2	2.25	185	4.88
Total		93	100	4612	100	89	100	3789	100

T-Test Analysis of Number of Fish Catches (Tails)

Based on research that has been carried out, the number of catches using wire trap fishing gear using different baits in Kelari Lake, Muaro Jambi Village, for 20 days can be seen in Table 2.

Information	Treatment	
	Palm oil	Coconut Dregs
Total (Tails)	93	89
Mean (Tails)	4.65	4.45
Stddev	1.182103	1.050063
T-Count	0.565685	
T-Table	2,02439	

T-Test Analysis of Fish Catch Weight (Grams)

Based on the research that has been carried out, the number of catches using wire trap fishing gear using different baits in Kelari Lake, Muaro Jambi Village, for 20 days can be seen in Table 3.

Information	Treatment	
	Palm oil	Coconut Dregs
Total (Tails)	4614	3689
Mean (Tails)	230.7	184.45
Stddev	116.1787	62.76143
T-Count	1.566381	
T-Table	2.024394164	

Environmental Parameters

This study measured several environmental parameters, namely temperature (°C), pH, and depth (m). The results of these measurements can be seen in Table 3.

No	Environmental Parameters	Measurement results	Average
1	Temperature (°C)	26-30 (°C)	28.2 (°C)
2	pH	7.5-8.5	7.72
3	Trap Depth (cm)	50 cm	50 cm

Fish Appearance Frequency

Frequency of Occurrence is used to determine the dominant species of fish caught that frequently appear at the fishing location. In ecology, frequency is used to express the proportion or number of samples containing a particular species compared to the total number of samples. High species diversity indicates that a community has high complexity, because within the community there is also a high level of species interaction (Kasmawati, 2015). The frequency of fish occurrence can be seen in Table 4.

No	Types of Fish	Latin name	Number of Frequencies		Percentage (%)	
			Palm oil	Coconut Dregs	Palm oil	Coconut Dregs
1	Nilem	*Osteochilus hasseltii*	14	15	70	75
2	Sebarau	*Hampala macrolepidota*	11	9	55	45
3	Kapiat	*Barbonymus schwanenfeldii*	15	13	75	65

4	Tembakang	*Helostema temminckii*	12	10	60	50
5	Gabus	*Channa Striata*	2	0	15	0
6	Sepat	*Trichopodus pectoralis*	2	3	10	15
7	Baung	*Hemibagrus nemurus*	3	4	15	10

DISCUSSION

Research Location Conditions

Kabupaten Muaro Jambi is one of the administrative regions in Jambi Province, geographically located between 1°51' to 2°1' South Latitude and 103°15' to 104°30' East Longitude. This regency is divided into 11 sub-districts, one of which is Muaro Sebo Sub-district, which has a total area of 261.47 km² (Badan Pusat Statistik Provinsi Jambi, 2023). Muaro Sebo Sub-district consists of 20 villages, namely Bakung, Baru, Danau Kedap, Danau Lamo, Jambi Kecil, Jambi Kulo, Kemingking Dalam, Kemingking Luar, Kunangan, Lubuk Raman, Mudo, Mudung Darat, Niaso, Sekumbung, Setiris, Talang Duku, Tanjung Katung, Tebat Patah, Teluk Jambu, as well as Muara or Muaro Jambi Village (BPS Muaro Jambi, 2020).

Wire Fish Trap Catch Results

Based on Table 1, it is shown that the catch obtained from wire fish traps during the study consisted of seven species, namely Nilem fish (*Osteochilus hasseltii*), Sebarau fish (*Hampala macrolepidota*), Kapiat fish (*Barbonymus schwanenfeldii*), Tembakang fish (*Helostema temminckii*), Snakehead fish (*Channa striata*), Sepat fish (*Trichopodus pectoralis*), and Baung fish (*Hemibagrus nemurus*). The highest catch using coconut dregs bait was Nilem fish, with a total of 29 individuals (32.58%), a weight of 1,387 g (36.61%). The lowest catch using coconut dregs bait was Snakehead fish, with 0 individuals (0.00%) and a weight of 0 g (0.00%). Snakehead fish are classified as species commonly found in swamp ecosystems (Nurdawati *et al.*, 2013). Swamp habitats characterized by stagnant water with gentle flow are highly suitable for snakehead fish; therefore, they are rarely found in lakes or rivers with strong currents (Soraya *et al.*, 2021).

The highest catch using oil palm bait was Kapiat fish, totaling 25 individuals (26.88%) with a weight of 1,205 g (26.13%). The lowest catch using oil palm bait was Sepat fish, with 3 individuals (4.30%) and a weight of 139 g (3.01%).

t-Test Analysis of Number of Fish Catches (Individuals)

Based on the t-test analysis, it was shown that the average number of fish caught using wire traps baited with oil palm and coconut dregs did not differ significantly (P>0.05). The mean number of catches using oil palm bait was higher than that using coconut dregs bait. Several studies indicate that although statistically there is no significant difference in the number of fish caught using oil palm and coconut dregs bait, oil palm bait tends to yield higher catch numbers. This is presumably due to the stronger aroma and higher nutritional content of oil palm, making it more effective in attracting fish compared to coconut dregs (Rahman *et al.*, 2019).

t-Test Analysis of Fish Catch Weight (Grams)

Based on the t-test analysis, it was shown that the average weight of fish caught using wire traps with oil palm and coconut dregs bait did not differ significantly (P>0.5). The mean catch weight using oil palm bait was higher than that using coconut dregs bait. Based on the study results, the average weight of fish caught using oil palm bait was recorded to be higher

than that obtained using coconut dregs bait. Oil palm contains oils and organic compounds that can trigger positive responses in fish, making this bait more effective in attracting fish into fishing gear such as wire traps. Research conducted by Hidayat and Sari (2019) also found that the use of oil palm bait resulted in higher catch weights compared to coconut dregs bait in lake waters.

Environmental Parameters

Based on the results of the environmental parameter measurements presented in Table 3, which include temperature (°C), pH, and trap placement depth (cm), it is known that the water temperature of Kelari Lake fluctuates due to natural phenomena. The average water temperature of Kelari Lake, Muaro Jambi Village, was 28.2 °C, with a range of 26–30 °C. According to the literature, freshwater temperatures of approximately 26–30 °C have been proven to support growth and metabolic activities of fish such as tilapia. Therefore, the average temperature range of 28.2 °C recorded in Kelari Lake can be considered close to optimal for the survival of fish and other aquatic organisms (Makori *et al.*, 2017).

The average pH value of Kelari Lake waters was 7.72, within a range of 7.5–8.5. This fluctuation remains within normal limits and does not indicate excessively acidic or alkaline conditions. pH values outside this range can negatively affect aquatic organisms by disrupting metabolic and respiratory processes. The relatively neutral pH conditions in Kelari Lake support the sustainability of aquatic life within the ecosystem. This is consistent with the opinion of the EPA (2004). In addition, water pH values within the range of 7.5–8.5 are considered suitable for the survival of freshwater fish and macroinvertebrates. Freshwater organisms can function optimally within this pH range, whereas pH values outside this range may cause stress or even mortality.

Fish Occurrence Frequency

Based on Table 4, it can be observed that the fish species with the highest occurrence frequency for both bait types (oil palm and coconut dregs) were Nilem fish (*Osteochilus hasseltii*) and Kapiat fish (*Barbonymus schwanenfeldii*). When using oil palm bait, Kapiat fish exhibited an occurrence frequency of 15 times (75%), while Nilem fish appeared 14 times (70%). Meanwhile, when using coconut dregs bait, Nilem fish showed the highest occurrence frequency, appearing 15 times (75%), followed by Kapiat fish with 13 occurrences (65%). This indicates that these two species are the dominant species most frequently captured using wire traps with different bait types. In addition to these two species, Tembakang fish (*Helostema temminckii*) and Sebarau fish (*Hampala macrolepidota*) were also frequently captured, with 12 and 11 occurrences using oil palm bait, and 10 and 9 occurrences using coconut dregs bait, respectively. Other species such as Snakehead fish (*Channa striata*), Sepat fish (*Trichopodus pectoralis*), and Baung fish (*Hemibagrus nemurus*) exhibited relatively low capture frequencies (<20%), indicating that these species were less responsive to the two bait types used.

CONCLUSION

Based on the results of the study, it was found that the fish species successfully captured using wire fish traps in Kelari Lake, located in Muaro Jambi Village, Muaro Sebo Sub-district, Muaro Jambi Regency, consisted of seven species, namely Nilem (*Osteochilus hasseltii*), Kapiat (*Barbonymus schwanenfeldii*), Sebarau (*Hampala macrolepidota*), Tembakang (*Helostema temminckii*), Snakehead (*Channa striata*), Sepat (*Trichopodus pectoralis*), and Baung (*Hemibagrus nemurus*). Catches using oil palm bait were numerically dominated by Nilem fish. Similarly, catches using coconut dregs bait were also dominated by Nilem fish. The

catch results using oil palm bait, both in terms of number of individuals and weight (g), were higher than those obtained using coconut dregs bait.

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